



Capstone Project Title Approval Form

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| Group Code: [SD-3E1] | | |
| Proponents | | |
| Project Leader: June Charles Mariquit | | |
| Group Members: Daniela Marquez Rubylyn Rey Jayron Sadian | | |
| Proposed Capstone Project Title | | |
| NetWatch: An Intuitive Dashboard for Tracking and Managing Wi-Fi Routers | | |
| Name and Contact No. or Target Organization | | |
| College of Information and Computing Sciences (CICS) | | |
| Platform | | |
| Web base, Android application, SQL database | | |
| Background of the Organization/Firm/Target Pilot Area | | |
| The target pilot area operates within a dynamic educational environment, situated within a bustling campus. This area is dedicated to exploring and implementing innovative educational initiatives and technology integration to enhance the overall learning experience for students. The target pilot area specifically encompasses a computer lab dedicated to monitoring Wi-Fi networks. This lab serves as a controlled environment for testing and evaluating network monitoring solutions, allowing for focused assessment and refinement of these technologies before potential deployment in wider educational contexts. | | |
| Problem Statement | | |
| Problems | Causes | Solutions (As a Feature of your System) |
| Limited Visibility: Traditional methods of monitoring Wi-Fi networks in computer labs often provide limited visibility into network performance, making it challenging to identify and address issues promptly. | Lack of Comprehensive Monitoring Tools: Existing monitoring tools may lack the capabilities to provide comprehensive insights into Wi-Fi network performance, leading to gaps in visibility. | Real-time Monitoring Dashboard: Implement a centralized dashboard providing comprehensive visibility into Wi-Fi network performance metrics, enabling prompt issue identification and resolution. |
| Manual Monitoring Tasks: Network administrators are burdened with manual monitoring tasks, requiring significant time and effort to track network activity and troubleshoot connectivity issues. | Complexity of Network Infrastructure: The complexity of network infrastructure within computer labs, coupled with the dynamic nature of network traffic, makes it challenging to effectively monitor and | Automated Alerting Mechanisms: Incorporate automated alerts to notify administrators of potential network issues, ensuring proactive response and minimizing downtime. |



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| | manage network activity. | |
| Inefficient Resource Allocation: Without real-time insights into network usage patterns, resources such as bandwidth allocation may be inefficiently distributed, leading to suboptimal network performance. | Manual Monitoring Processes: Reliance on manual monitoring processes results in delays in identifying and resolving network issues, as administrators must manually sift through data to detect anomalies. | Advanced Analytics and Reporting: Utilize analytics and reporting tools to analyze network usage patterns, optimizing resource allocation and enhancing network efficiency. |
| Objectives | | |
| <p>Our system aims to achieve several key objectives to enhance the monitoring and management of Wi-Fi networks in computer labs:</p> <p>Firstly, it seeks to provide administrators with real-time insights into Wi-Fi network performance. By offering a centralized dashboard displaying comprehensive metrics, such as bandwidth usage and device connectivity, our system enables administrators to promptly identify and address any network issues that may arise.</p> <p>Secondly, the system aims to streamline monitoring tasks by incorporating automated alerting mechanisms. These alerts notify administrators of potential network issues, reducing the need for manual monitoring and ensuring proactive response to minimize downtime.</p> <p>Lastly, our system utilizes advanced analytics to optimize resource allocation and enhance network efficiency. By analyzing network usage patterns and trends, administrators can make informed decisions regarding resource allocation, leading to improved network performance and user experience within computer labs.</p> | | |
| Specific Objectives | | |
| <ul style="list-style-type: none">• Real-Time Monitoring: Develop a centralized dashboard that provides administrators with real-time insights into Wi-Fi network performance metrics, including bandwidth utilization, device connectivity, and network health.• Automated Alerting: Implement automated alerting mechanisms to promptly notify administrators of potential network issues, such as connectivity disruptions or bandwidth overutilization, enabling proactive response and minimizing downtime.• Usage Analytics: Integrate advanced analytics capabilities to analyze network usage patterns and trends, allowing administrators to identify areas of high demand, optimize resource allocation, and enhance overall network efficiency.• Device Management: Enable administrators to efficiently manage connected devices within the computer lab environment, including the ability to monitor device health, enforce access controls, and troubleshoot connectivity issues remotely. | | |



- **User Authentication:** Implement robust user authentication mechanisms to ensure secure access to the monitoring system, allowing only authorized personnel to view and manage network performance data.
- **Scalability and Interoperability:** Design the system to be scalable and interoperable with existing network infrastructure and management tools, accommodating future growth and facilitating seamless integration with other network management systems.
- **User-Friendly Interface:** Develop an intuitive and user-friendly interface that simplifies navigation and facilitates easy access to critical network performance data, empowering administrators with the tools they need to effectively monitor and manage Wi-Fi networks within computer labs.

Specific Functions and Features

- **Real-Time Performance Monitoring:** Implement a centralized dashboard to provide administrators with real-time visibility into Wi-Fi network performance metrics, including bandwidth usage, device connectivity status, and network health indicators.
- **Automated Alerting System:** Develop an automated alerting mechanism to promptly notify administrators of critical network events, such as connectivity disruptions, bandwidth spikes, or device failures, ensuring proactive response and minimizing downtime.
- **Usage Analytics and Reporting:** Integrate advanced analytics tools to analyze network usage patterns, identify trends, and generate comprehensive reports on network performance metrics. This feature enables administrators to optimize resource allocation and plan for future network capacity needs.
- **Device Management and Inventory:** Create functionality to manage connected devices within the computer lab environment, including inventory tracking, device health monitoring, and remote troubleshooting capabilities.
- **User Authentication and Access Control:** Implement robust user authentication mechanisms to ensure secure access to the monitoring system. Administrators can define user roles and permissions, restricting access to sensitive network data to authorized personnel only.
- **Scalability and Interoperability:** Design the system to be scalable, allowing for seamless expansion as the network grows. Ensure interoperability with existing network infrastructure and management tools, facilitating integration and compatibility with other systems.
- **Customizable Dashboard Widgets:** Provide customizable dashboard widgets that allow administrators to personalize their monitoring experience, displaying relevant network performance metrics and alerts based on their preferences and requirements.



- **Historical Data Storage and Analysis:** Enable the storage of historical network performance data for trend analysis and long-term planning. Administrators can access past performance metrics to identify patterns, troubleshoot recurring issues, and make informed decisions about network optimization.
- **Mobile Access and Remote Management:** Develop mobile-friendly interfaces or applications to enable administrators to monitor and manage the Wi-Fi network remotely, providing flexibility and convenience in network administration tasks.
- **Integration with Network Devices and APIs:** Ensure seamless integration with Wi-Fi routers and other network devices, allowing administrators to retrieve real-time data and perform management tasks directly from the monitoring system. Additionally, provide APIs for integration with third-party applications and tools for extended functionality and automation.

Significance and Possible Users

Significance:

- **Improved Network Performance:** The system boosts network performance in computer labs through real-time monitoring and proactive issue resolution, ensuring reliable connectivity for users.
- **Enhanced User Experience:** Students, faculty, and staff benefit from a more stable Wi-Fi network, resulting in smoother access to digital resources and improved productivity.
- **Cost Efficiency:** By optimizing resource allocation and reducing manual efforts, the system helps lower operational costs and prevents costly network downtime.

Possible Users:

- **Network Administrators:** Responsible for managing Wi-Fi networks, they use the system to monitor performance, troubleshoot issues, and ensure network reliability.
- **IT Support Staff:** Utilize the system for efficient troubleshooting and resolving user-reported network problems.
- **Faculty and Staff:** Enjoy improved access to digital resources and online collaboration tools, enhancing their teaching, research, and administrative tasks.
- **Students:** Experience a more seamless learning experience with reliable network connectivity for coursework and collaboration in computer labs.

Level of Feasibility

Technical Feasibility: The technical feasibility of implementing the system is high, given the availability of networking technologies and monitoring tools. However, integration with existing network infrastructure and compatibility with hardware and software platforms may require thorough assessment.

Financial Feasibility: Financial feasibility depends on the budget allocated for the project, including development costs, hardware procurement, and ongoing



maintenance expenses. Cost-benefit analysis should be conducted to ensure the project's viability within budget constraints.

Operational Feasibility: Operationally, the system's success relies on the commitment and support of stakeholders, including network administrators, IT staff, and end-users. Adequate training and user support mechanisms should be in place to facilitate system adoption and utilization.

Legal and Regulatory Feasibility: Compliance with data privacy regulations and institutional policies is crucial. The system should adhere to legal requirements regarding data security, user privacy, and network monitoring practices to mitigate legal risks and ensure ethical use of data.

Schedule Feasibility: The project timeline should be realistic, considering factors such as development, testing, deployment, and user training. Milestones should be clearly defined, and project progress should be regularly monitored to ensure timely completion.

| For Review Committee Only | |
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| Comments: | |
| <div></div> | |
| <div>Status:<div><input type="checkbox"/> For Revision<input type="checkbox"/> Approved<input type="checkbox"/> Disapproved</div></div> | <div><div></div>Signature Over Printed Name</div> |

Note: You may attach the results of your survey and feasibility analysis, if needed.